

U.S. Serial No. 10/533,896 Shinmura et al.
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Listing of the Claims:

Please withdraw claims 21-24

1. (previously presented) An actuator device, comprising:
 - a device housing;
 - a drive motor located in the device housing;
 - a power transmission mechanism located in the device housing and is coupled to the drive motor;
 - an output shaft coupled to the power transmission mechanism, rotation of the drive motor is transmitted to the output shaft via the power transmission mechanism;
 - a sensor for detecting the rotation angle of the output shaft;
 - a sensor accommodating portion for accommodating the sensor;
 - a connector portion including a connector housing and a connector terminal, which is incorporated in the connector housing and is connected to an external connector; and
 - a power supply portion including a power supply terminal, which is connected to the drive motor and supplies electric power to the drive motor,
- wherein the power supply terminal and the sensor are electrically connected to the connector terminal, electric power is supplied to the drive motor from the outside and a rotation angle signal obtained by the sensor is sent to the outside via the external connector and the connector terminal, and
- wherein the sensor accommodating portion, the connector portion, and the power supply portion are integrally formed to form a single assembly mounted on the device housing.

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2. (previously presented) The actuator device according to claim 1, the device housing includes a first case and a second case, and when the assembly is mounted on the device housing, the first case and the second case hold the connector portion.

3. (previously presented) The actuator device according to claim 1, the device housing includes a first case and a second case, and when the assembly is mounted on the device housing, the first case and the second case hold the connector housing.

4. (previously presented) The actuator device according to claim 1 wherein the power transmission mechanism includes a plurality of gears, one of the gears has the output shaft and includes a recess for accommodating the sensor accommodating portion.

5. (previously presented) The actuator device according to claim 4, wherein the gear having the recess has a cylindrical gear portion, and the cylindrical gear portion defines the recess.

6. (previously presented) The actuator device according to claim 4, wherein the sensor is coupled to the output shaft to rotate integrally with the output shaft in the recess.

7. (previously presented) The actuator device according to claim 1 wherein the assembly is substantially L-shaped.

8. (previously presented) The actuator device according to claim 1 wherein the sensor accommodating portion, the connector portion, and the power supply portion are molded using resin to form the assembly.

9. (previously presented) The actuator device according to claim 8, wherein the power supply terminal and the connector terminal are integrally incorporated in the assembly.

10. (previously presented) The actuator device according to claim 1 wherein the power supply terminal and the connector terminal are formed of a single conductive plate, the conductive plate further including a wiring portion, the wiring portion including a connecting portion, which is connected to the sensor, and a coupling portion, which can be arbitrarily cut, and the connecting state among the connecting portion, the connector terminal, and the power supply terminal is determined in accordance with the cutting state of the coupling portion.

11. (previously presented) The actuator device according to claim 10, wherein the assembly is molded using resin such that the conductive plate is integrally incorporated.

12. (previously presented) The actuator device according to claim 11 wherein the assembly is molded such that the wiring portion is exposed to the outside.

13. (previously presented) The actuator device according to claim 1 wherein the power transmission mechanism includes a motor gear attached to the rotary shaft of the drive motor and a plurality of gears forming a series of gears coupled to the motor gear, and at least one of the gears, which form the series of gears, integrally includes a depression portion for depressing the gear in the axial direction.

14. (previously presented) The actuator device according to claim 13, wherein the gear including the depression portion has a shaft portion, and the depression portion is located radially outward of the shaft portion.

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15. (previously presented) The actuator device according to claim 14, wherein the gear including the depression portion further includes:

a small diameter gear portion located on the shaft portion;

a cylindrical large diameter gear portion located radially outward of the shaft portion; and

a coupling portion, which radially extends between the shaft portion and the large diameter gear portion to integrally couple the large diameter gear portion to the shaft portion,

wherein the depression portion extends from the coupling portion in the circumferential direction of the corresponding gear.

16. (previously presented) The actuator device according to claim 13, wherein the gear including the depression portion has a small diameter gear portion and a large diameter gear portion, which are integrally formed with each other, and the depression portion is provided on the large diameter gear portion to be located radially outward of the small diameter gear portion.

17. (previously presented) The actuator device according to claim 15, wherein the motor gear is a worm, and the large diameter gear portion is a worm wheel engaged with the worm.

18. (previously presented) The actuator device according to wherein the depression portion is one of a plurality of depression portions arranged at equal angular intervals about the axis of the corresponding gear.

19. (previously presented) The actuator device according to claim 13 wherein the device housing has a receiving surface for slidably receiving the depression portion, the receiving surface has a recess for accommodating lubricant agent at a position corresponding to a sliding path of the depression portion.

20. (previously presented) The actuator device according to claim 19, wherein the recess is groove-like and extends to be inclined with respect to the radial direction of the corresponding gear.

21. (withdrawn) An actuator device, comprising:

a drive motor, which has a rotary shaft;

a motor gear attached to the rotary shaft;

a plurality of gears forming a series of gears coupled to the motor gear; and

an output shaft coupled to the series of gears, rotation of the rotary shaft is transmitted to the output shaft via the series of gears,

wherein at least one of the gears, which form the series of gears, integrally includes a depression portion, which depresses the gear in the axial direction, and the depression portion applies load on the rotary shaft in a direction that intersects the axis of the rotary shaft.

22. (withdrawn) The actuator device according to claim 21, wherein the gear including the depression portion has a shaft portion, and the depression portion is located radially outward of the shaft portion.